

# **EPA - AUSTIN AVENUE SITE**

**FINAL REPORT**

**FOR**

**28 LEWIS AVENUE**

Prepared by:

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## 1.0 TITLE

Final Report for the Radiological Remediation of 28 Lewis Avenue.

## 2.0 BACKGROUND

### 2.1 Site History

In May of 1992, the property located at 28 Lewis Avenue, Lansdowne, PA 19050 was found to be radiologically contaminated with Radium-226 and its parent and daughter products.

The source of the contamination found on this site is a radium extraction process which operated in Lansdowne between 1915 and 1922 and it is believed that the contamination of the property occurred during this time. During the period in question, the byproduct tailings (containing both radium and natural uranium) from the radium extraction process were used as aggregate material in mortar and plaster resulting in the contamination of several dwellings and properties in the Lansdowne area.

### 2.2 Site Release Criteria

In order to release properties located at the USEPA Austin Avenue Radiation Site for unrestricted use, the standards listed in Table 2.1 and Table 2.2 below are to be applied as applicable.

**TABLE 2.1**  
**REFERENCES APPLIED FOR FACILITY RELEASE**

<u>Applicable Limit</u>	<u>Reference</u>
Surface Contamination Limits	USNRC, <u>Regulatory Guide 1.86</u>
Radon Gas Concentration Limits	USEPA, <u>Citizen's Guide to Radon</u>
Specific Activity Limits for Radon Gas Precursors	Code of Federal Regulations, Title 40, Part 192
Gamma Exposure Limits	Code of Federal Regulations, Title 40, Part 192

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**TABLE 2.2**  
**AUSTIN AVENUE SITE FACILITY RELEASE CRITERIA**

<u>Release Parameter</u>	<u>Release Limit</u>
Removable Alpha Contamination	Less than 20 dpm/100cm <sup>2</sup>
Fixed Alpha Contamination	Less than 100 dpm/100cm <sup>2</sup> average activity and less than 300 dpm/100cm <sup>2</sup> maximum activity.
Removable Beta-Gamma Contamination	Less than 1000 dpm/100cm <sup>2</sup>
Fixed Beta-Gamma Contamination	Less than 5000 dpm/100cm <sup>2</sup> average activity and less than 15,000 dpm/100cm <sup>2</sup> maximum activity.
Radon Gas Concentration at Lowest Ground Contacting Level	Less than 12 pCi/liter
Radon Gas Concentration Average for All Occupied Levels	Less than 4 pCi/liter
Radium-226 Activity in Soil at Less Than 15 cm Below Ground Surface	Less than 5 pCi/g average activity and less than 15 pCi/g maximum activity.
Radium-226 Activity in Soil at Greater Than 15 cm Below Ground Surface	Less than 15 pCi/g average activity and less than 45 pCi/g maximum activity.
Gamma Dose Rate (for facilities not released using radium activity limits above)	Less than 20 $\mu$ R/hr above normal background levels.

### 3.0 SITE CHARACTERIZATION

The site characterizations for the properties were conducted in May of 1992. The Characterization Reports are included in this report as Attachment A.

#### 4.0 REMEDIATION CHRONOLOGY

On October 20, 1992, ETI, at the direction of the USEPA, began the preparation for the removal of Naturally Occuring Radioactive Material ("NORM") soil from the 28 Lewis Avenue property. Preparation included the following activities: Covering clean areas with poly, setting up a decon area, and placing a fence around the contamination zone. Emergency and escape routes were also established.

On October 21, 1992, ETI began the removal of "NORM" contaminated soil and asphalt from the 28 Lewis Avenue property. The removal process lasted from October 21, 1992 to October 29, 1992 with an average depth of 2.5 feet of soil removed.

ETI completed the removal process on October 29, 1992. Samples and surveys taken at the property indicated the levels of contamination were within the specified limits for the release of the property.

A total of 53 cubic yards of soil and asphalt were removed from the property.

## 5.0 FINAL SURVEY DATA

Since, for the 28 Lewis Avenue property, all contaminated soil was completely removed and replaced, and based on the Characterization Reports (Attachment A1), only the Specific Activity Release Limits need be applied for the release of the property. Table 2.3 shows the compiled maximum and average soil activities during remediation with appropriate verification data listed.

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10/10/92

28 LEWIS AVE

Location

DATE	LOCATION / DESCRIPTION	Sample	Depth	Initial Activity	Final Activity *	REMARKS	
		I.D.	Feet	Ra226- pci/g +- % Error @ 90%	Ra226- pci/g +- % Error @ 90%		
	28 LEWIS AVE						Tech
10/21/92	Soil under asphalt	1	0.5	7.0+-39		Soil characterizations	
		2	0.5	2.1+-51			
		3	0.5	7.7+-27			
		4	0.5	3.1+-44			
		5	0.5	12.9+-44			
		6	0.5	5.4+-32			
10/26/92	Soil excavation under asphalt	155	0.8	18.8+-15		Soil Remediation	
		159	0.8	18.0+-27			
10/21/92	Soil under asphalt	1	0.5	6.9+-43			
10/26/92	Soil under asphalt Release Data	1	1		5.0+-41	Soil Verifications	
	MCA Analysis	2	0.8		14.1+-22		
		3	0.8		13.2+-20		
		4	0.8		12.6+-20		
		5	0.8		4.9+-38		
		6	0.8		7.7+-30		
		7	0.8		2.7+-54		
		8	0.8		8.4+-24		
		9	0.8		4.7+-36		
		10	0.8		3.5+-42		
	Soil composite around tree	11	0.5		16.1+-24	Soil Release	
10/20/92	Release Verifications	1	0.5		.8+-134	Asphalt Verifications	
	Asphalt Samples - MCA Analysis	2	0.5		.5+-139		
		3	0.5		1.1+-72		
		4	0.5		1.0+-57		
		5	0.5		.8+-55		
		6	0.5		1.1+-49		
		7	0.5		.7+-82		
		8	0.5		.4+-183		
		9	0.5		.5+-101		

Soil Release Criteria: <= 15 cm soil depth @ 5 pci/g ave. [Ra226]> Site Bkd @ 2.1 pci/g  
> 15 cm soil depth @ 15 pci/g [Ra226] ave. over approx. 100m2  
\* Typical MCA Ra226 LLD (.186 Mev) @ 1.6 pci/g +- % error @ 90% Confidence Level Wet



**ATTACHMENT A**  
**CHARACTERIZATION REPORTS**

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## I. INITIAL SOIL CHARACTERIZATION REPORT